

REPORT ON THE FISHES DREDGED IN DEEP WATER
NEAR THE HAWAIIAN ISLANDS, WITH DESCRIPTIONS
AND FIGURES OF TWENTY-THREE NEW SPECIES.

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THE MATERIAL forming the basis of this report was secured by the United States Fish Commission steamer *Albatross* in December, 1891, while engaged in surveying a cable route between California and Honolulu. Eight hauls were made with the beam trawl in Kaiwi Channel, Hawaiian Islands, at depths of 295 to 375 fathoms. The fishes obtained are of extreme interest, all but five of the twenty-six species secured being undescribed. Most remarkable among them is *Pelecanichthys*, a new generic type of deep-sea flounder, with distensible gular pouch. Two species are included which were obtained in the same locality by the use of the surface tow net.

The following is a list of dredging stations, with names of species secured at each. Additional data concerning stations can be found in the report of the United States Commissioner of Fish and Fisheries.¹

STATION 3467.

[Depth, 310 fathoms.]

Promyllantor alcocki.

Hymenocephalus antrawus.

Diaphus urolampus.

Malthopsis mitriger.

Myctophum fibulatum.

The two specimens of *Chimara* said to have been taken at this station² were not included in the material submitted to us.

STATION 3470.

[Depth, 343 fathoms.]

Dasy Scopelus macrolepidotus.

Chaliurus etnomelas.

Peristedion hians.

Optonurus atherodon.

Hymenocephalus antrawus.

Malacocephalus lewis.

¹ Report of 1892, p. 58.

² Report of the Commissioner, U. S. Fish and Fisheries, 1892, p. 18.

STATION 3471.

[Depth, 337 fathoms.]

Carlocephalus acipenserinus.
Hymenocephalus antraus.

Optonurus atherodon.

STATION 3472.

[Depth, 295 fathoms.]

Diaphus urolampus.
Argyripinus ephippiatus.
Melanostoma argyreum.
Peristedion hians.
Calorhynchus gladius.

Chalinurus ctenomelas.
Malacocephalus laevis.
Pelecanichthys crumenalis.
Malthopsis mitriger.

The eels reported from this station¹ were not submitted to us.

STATION 3473.

[Depth, 313 fathoms.]

Sternoptyx diaphana.
Calorhynchus parallelus.
Carlocephalus acipenserinus.

Macrourus ectenes.
Macrourus propinquus.

STATION 3474.

[Depth, 375 fathoms.]

Congermyx aquorea.
Dasy Scopelus macrolepidatus.
Carlocephalus acipenserinus.
Macrourus holocentrus.

Macrourus gibber.
Trachourus scutipellis.
Optonurus atherodon.

The *Sternoptyx* listed from this station² did not appear in our material.

STATION 3475.

[Depth, 351 fathoms.]

Chlorophthalmus prouidens.
Carlocephalus acipenserinus.
Macrourus propinquus.
Macrourus holocentrus.

Macrourus gibber.
Optonurus atherodon.
Malacocephalus laevis.

STATION 3476.

[Depth, 298 fathoms.]

Chlorophthalmus prouidens.
Polyipnus spinosus.
Melanostoma argyreum.
Scorpana venigera.
Peristedion hians.
Carlocephalus acipenserinus.

Hymenocephalus antraus.
Optonurus atherodon.
Malacocephalus laevis.
Pelecanichthys crumenalis.
Malthopsis mitriger.

¹ Report of the Commissioner, U. S. Fish and Fisheries, 1892, p. 18.

² Loc. cit.

Family LEPTOCEPHALIDÆ.

PROMYLLANTOR ALCOCKI, new species.

(Plate XXXVI, fig. 1.)

Head $7\frac{1}{5}$ to $7\frac{1}{2}$ in total length ($8\frac{1}{2}$ in a young specimen), depth about $17\frac{1}{2}$ to $18\frac{1}{4}$. Head and trunk much shorter than tail, about $1\frac{2}{7}$ to 2 in the latter. Pectorals 12 to 13 rays.

Body very slender, compressed. Head about as deep as wide, tapering forward to a broad, flat snout, which is acute at tip. Snout $3\frac{1}{4}$ to $3\frac{1}{2}$ in head, projecting about two-fifths to one-third of its total length beyond the tip of the lower jaw. Eye circular, very small, about 3 to $3\frac{1}{2}$ in snout (3 in young), high up, its center about one-third of the distance from tip of snout to gill opening. Interorbital space about 3 in snout, a little more than eye, nearly flat. Top of head transparent, the outlines of the brain distinctly visible. Anterior nostril with a very short tube on the infero-lateral part of the snout, about midway between tip of snout and tip of lower jaw. Posterior nostril an oval opening above the anterior half of the eye. Pores on snout: a small pair immediately in front of premaxillary teeth; another larger under tip of snout; one over and one behind anterior nostril; two others above the edge of the upper lip; one behind angle of jaw. Gape of mouth scarcely reaching front of orbit. Teeth in villiform bands in both jaws, those of lower jaw in about 4 or 5 well-defined series along the sides; a large, broad band of teeth on vomer. Tongue free. Lips thin, but somewhat pendent and partly concealing the gape. Gill openings small, about 3 in snout (smaller in young), far apart, the distance between them about $4\frac{2}{3}$ in head. Gills, 4; the rakers present, but excessively minute. Lateral line above middle of body anteriorly. No scales. The low dorsal fin begins about opposite the tip of the pectoral fin; the distance between the tip of snout and the origin of the dorsal about $5\frac{1}{2}$ in the total length (6 in young). Occiput a trifle nearer front of dorsal than tip of snout. The very low anal fin begins immediately behind the vent. Pectorals very small, pointed, a little shorter than the snout.

Color (in alcohol).—Light brownish yellow. Fins pale. Abdomen greenish. Lips dark. Inside of mouth light. Gill cavities black. Peritoneum blackish or dusky. Type $10\frac{1}{4}$ inches long, with well developed ova.

Nine specimens, $7\frac{1}{2}$ to $10\frac{1}{4}$ inches long, from station 3472; 295 fathoms.

Type.—No. 47724, U.S.N.M.

CONGERMURÆNA ÆQUOREA, new species.

(Plate XXXVII.)

Head $6\frac{1}{2}$ to $6\frac{1}{3}$ in total length; depth about 15 to 18. Head and trunk much shorter than tail, about $1\frac{3}{5}$ in the latter. Pectoral rays 14 to 15.

Body slender, compressed. Head as deep as wide, tapering forward to a flat snout. Snout 3 to $3\frac{1}{4}$ in head, slightly more than twice as long as the eye, projecting two-thirds the diameter of the eye beyond the tip of the lower jaw. Eyes somewhat elliptical, their upper margins near dorsal profile. Interorbital space about equal to long diameter of eye. Anterior nostril a broad, short tube situated on the antero-lateral part of the snout, and a little nearer the mouth than the dorsal profile; posterior nostril a large, elliptical opening in front of the upper third of the eye, less than its own diameter from the eye. Pores of snout arranged as follows: A small pair under tip of snout just in front of anterior teeth; a large one in front of, a second above, and a third immediately behind, anterior nostril; four others along the side of the upper jaw; one behind angle of mouth. A row of about 10 pores on each mandible, beginning at tip of lower jaw and extending beyond its posterior angle. Angle of mouth reaching middle of orbit. Lips thin. Maxillary teeth close set in a broad villiform band, the outer teeth longer than the inner. Vomerine teeth much larger, forming a broad transverse patch in advance of maxillary teeth. A very few small teeth on shaft of vomer. Mandibular teeth in a narrow cardiform band anteriorly, diminishing much in size toward angle of mouth. Tongue free. Gill openings far apart, their width a little greater than diameter of eye, the distance between them about 5 in head. Gills 4; no rakers. Lateral line above middle of body anteriorly. The dorsal fin begins slightly behind the base of the pectoral, its distance from occiput equaling distance of latter from center of eye. Pectorals small, pointed, equal to the snout.

Color (in alcohol).—Brown; head and back dusky. A large, dark, opercular spot; another small one above each eye, and a dark streak on snout in front of eye. Sides of tail with coarse black specks, much more numerous in one of the specimens than in the other, mainly collected into two lengthwise lines running parallel with the bases of the dorsal and anal; the other specimen is almost plain. Marginal portions of dorsal and anal fins dusky, becoming black posteriorly, basal portions light. Inside of mouth a little dusky. Peritoneum silvery, speckled, or brownish. Alimentary canal black.

Two specimens, $16\frac{1}{4}$ and $18\frac{1}{2}$ inches long, from station 3474; 375 fathoms.

Type.—No. 47696, U.S.N.M.

Family AULOPIDÆ.

CHLOROPHTHALMUS PRORIDENS, new species.

(Plate XXXVI, fig. 2.)

Head $3\frac{2}{5}$; depth $5\frac{3}{5}$. 1 D. 10 to 12; A. 10; P. 14 to 15; V. 9; lateral line 50.

Body as broad as deep in front of first dorsal; compressed below and behind this fin. The least depth of tail $2\frac{2}{3}$ in greatest depth of trunk.

Head depressed throughout, broad behind and narrowing by slightly rounded lateral outlines to a broad flat, much depressed, somewhat scoop-shaped snout. Width of head behind orbit $1\frac{1}{5}$ to 2 in its length; width of snout at end of its anterior fourth $3\frac{2}{5}$ in head. Bones of the head very thin and cavernous. Orbits enormously large, a little longer than deep, $2\frac{2}{5}$ in head. Interorbital space very narrow, about $6\frac{1}{2}$ in orbit, with a median groove bordered on each side by two small ridges. Snout $3\frac{3}{8}$ in head. Lower outline of the head markedly rounded; mouth oblique, the maxillary abruptly expanded behind, rounded at the end, and reaching to about the front of the pupil or a little beyond. Premaxillary very slender, nearly as long as the maxillary. Lower jaw entirely included laterally, much less oblique than the upper jaw, its tip forming a broad dentigerous lobe which enters the profile and extends well beyond the premaxillaries. Symphyseal teeth form a rounded patch on each side of the middle line, those of the anterior series largest, strong, conical, directed horizontally forward. Jaws with very narrow bands of small teeth; vomer with a few teeth on its prominent anterior descending processes; a short, very narrow band on palatines. Tongue broad, flat, and thin. Nostrils far apart, close to anterior rim of orbits. Posterior edge of preopercle directed downward and a little forward, its angle broadly rounded under posterior rim of orbit. Opercle broad, with a prominent triangular lobe reaching beyond the upper part of base of pectoral fin. Gill membranes not united. Pseudobranchiae large. Gill rakers slender, their length a little more than interorbital space, about 21 on horizontal limb of anterior arch. Scales large, thin, cycloid, somewhat deciduous; 6 in a transverse series between the lateral line and the origin of the dorsal fin. Interorbital space, snout, jaws, and (probably) opercles scaleless. Cheeks with excessively thin and weak scales. Distance from tip of snout to origin of first dorsal $2\frac{3}{4}$ in length of body; distance between dorsals $3\frac{2}{5}$, from tip of snout to base of ventrals $2\frac{2}{5}$, from base of ventrals to origin of anal $2\frac{1}{5}$, and from vent to origin of anal $3\frac{1}{5}$, in length of body. Base of the dorsal fin about $2\frac{2}{5}$ in head. Adipose dorsal small, above the middle of the anal. The anal far back, its base about 4 in head. Pectorals narrow, their base about 3 in orbit, their longest rays reaching to or beyond vent, about $1\frac{1}{2}$ in head. Ventral rays, especially the outer ones, strong, the longest (all injured) about $1\frac{1}{2}$ in head.

Color (in alcohol).—Parts where the scales have fallen off dusky brown. Scales quite silvery. The breast and sides above the ventral fins densely speckled with brownish black, other parts sparsely speckled. Snout, jaws, and interorbital space dusky. Cheeks silvery. Anterior part of first dorsal, three inner rays of ventrals, and upper part of axils, the gill cavities and posterior part of mouth cavity, black. Peritoneum black.

Type 7 inches, with well-developed ova.

Young, $3\frac{1}{4}$ inches long. Head $3\frac{3}{5}$; depth about 7; orbit, $2\frac{1}{5}$ in head; depth of tail, $2\frac{1}{5}$ in depth of trunk. Distance between dorsals 3, from

tip of snout to base of ventrals $2\frac{1}{2}$, from vent to origin of anal 4. in length of body. Faint traces of dark cross bands on body and tail.

Six specimens, $3\frac{1}{4}$ to 7 inches long, from stations 3475 and 3476; 351 and 298 fathoms, respectively.

Type.—No. 47715, U.S.N.M.

Family MYCTOPHIDÆ.

DIAPHUS UROLAMPUS, new species.

(Plate XXXVIII, fig. 1.)

Head $3\frac{2}{7}$; depth $4\frac{3}{5}$. D. 14 to 15; A. 14 or 15; P. 15; V. 8; lateral line about 29 to 35.

Body elongate, compressed, its width 2 in its depth; least depth of peduncle $2\frac{2}{5}$ in greatest depth of trunk. Dorsal and ventral outlines nearly similar, the former highest at origin of first dorsal fin. The depth at the nape very nearly equal to the depth at origin of first dorsal; depth at origin of anal $1\frac{1}{3}$ in this distance. Head stout, compressed, its dorsal outline parabolic, its greatest width over preopercle $1\frac{1}{2}$, and its width at anterior rim of orbit $2\frac{2}{5}$ in its greatest depth. Orbit moderate, circular, $3\frac{3}{8}$ in head. Interorbital space a little convex, broad, equal to orbit. Snout steep, blunt, short, 2 in orbit, its tip nearly on a level with the center of the eye. A slight median ridge running up on to the interorbital space. Mouth very large, somewhat oblique, curved upward a little in front of orbit; maxillary slender, but little expanded posteriorly, $1\frac{2}{5}$ in head, reaching about two-fifths of its own length beyond posterior rim of orbit. Teeth in narrow bands on jaws, vomer, and palatines. The sharp edges of the rami of the lower jaw nearly meeting in median ventral line. Nostrils about on a level with center of eye, the anterior opening about midway between tip of snout and anterior margin of orbit, much smaller than posterior opening. Posterior margin of preopercle very oblique. Opercle thin with a triangular lobe reaching about to base of pectoral; a little incurved above and below the lobe, scarcely covering the gills. Fourteen rakers on horizontal limb of anterior arch, the longest a little less than 2 in orbit. Bones of head thin, flexible; a ridge behind eye terminates in a rather strong spine at upper angle of preopercle.

Scales thin, cycloid, deciduous; 4 in a transverse series between lateral line and origin of first dorsal.

Photophores.—Mandibulars 4 pairs, very indistinct; operculars 2, the upper on level of base of pectoral fin, the lower minute, just behind angle of jaws; pectorals 3, the first immediately below lateral line, the second immediately in front of and below base of pectoral fin, the third nearly midway between this and the foremost thoracic spot; the second of these spots forms an obtuse angle with reference to the other two; thoracic 5, the first and second pairs far apart, the second pair nearly midway between first and fifth pairs, the fourth far up on the sides

above the interspace between the third and fifth pairs, the fifth in front of base of ventral fins; supraventral 1, immediately under lateral line; ventrals 5, the second and third high up on the sides and nearly on a level with the base of the pectoral fin; supraanals 3, forming nearly a right-angled triangle, with one of the spots above the hindmost ventral spot, the second immediately below the lateral line, and the third nearly above the first anterior anal spot; anterior anals 6, equidistant, the hindmost above and behind the fifth and on a line connecting the fifth anterior anal and the postero-lateral; postero-lateral 1, immediately under lateral line and above interspace between last anterior anal and first posterior anal; posterior anals 6, equidistant; caudals 4, in an obliquely directed shallow curve concave forward. The spots are divided into halves by a line of black pigment. A long gland extending the length of 6 or 7 scales, on the back of the caudal peduncle, present in five adults, faintly developed in one young specimen and entirely absent in one adult. No glandular photophore on snout.

The distance from tip of snout to origin of first dorsal or to base of ventrals $2\frac{3}{8}$ in length of body; from origin of first dorsal to second dorsal $2\frac{2}{3}$; length of base of first dorsal about $5\frac{2}{3}$; length of base of anal $5\frac{5}{6}$; from base of pectorals to base of ventrals 7; from base of ventrals to origin of anal $4\frac{1}{2}$ to $4\frac{4}{5}$ in length of body.

Pectoral fins inserted low, only a little above the line from outer part of base of ventrals to angle of mouth, the fins narrow, weak, about $2\frac{1}{4}$ in head. Ventral rays strong, reaching to or beyond origin of anal. Longest anal rays considerably less than 2 in head. Caudal deeply forked, the longest rays at least two-thirds as long as head.

Color (in alcohol).—Snout and anterior part of interorbital space whitish or yellowish; an area over each orbit and the upper part of eyeball black. Cheeks silvery; opercle silvery and black, breast and abdomen dusky silvery; body blackish; scales with some metallic luster. Gill and mouth cavities black. Fins all black at base, then whitish. Peritoneum black.

Seven specimens, $2\frac{1}{4}$ to $4\frac{1}{4}$ inches long, from stations 3467 and 3472; 310 and 295 fathoms respectively.

Type.—No. 47709, U.S.N.M.

This species differs from other known species of the genus in the absence of phosphorescent blotches on anterior part of head. This character seems to us to be of specific importance only.

DIAPHUS CHRYSORHYNCHUS, new species.

(Plate XXXVIII, fig. 2.)

Head $3\frac{2}{7}$ to $3\frac{3}{5}$; depth $4\frac{2}{5}$ to $4\frac{2}{3}$; D. 17; A. 16; P. 11; V. 8; lateral line, 34 to 35.

Body elongate, compressed, its width $1\frac{2}{3}$ in its depth. Dorsal and ventral outlines similar, the depth at nape and at origin of first dorsal

equal; least depth of peduncle $2\frac{1}{3}$ in greatest depth of trunk. Head heavy, compressed, its greatest width $1\frac{2}{3}$, and its width in front of orbit 3 in its greatest depth. Snout very blunt and short, its anterior profile nearly vertical. Orbit moderate, far forward, nearly circular, 3 to $3\frac{1}{4}$ in head. Interorbital space broad, convex, its width equal to orbit. A slight median ridge running up onto the interorbital space. Mouth large, oblique, the maxillary slender, $1\frac{2}{3}$ in head, its posterior end extending about one third of its total length beyond the posterior rim of orbit. Teeth small, in narrow bands on jaws and palatines; a single series on each jaw larger than the rest. A large patch of small teeth or asperities on pterygoid. Posterior edge of preopercle directed upward and forward. Opercle with a long, triangular pointed lobe, about on a level with lower edge of orbit and extending beyond the root of the pectoral, the edges above and below the lobe slightly emarginate, barely covering the gills. Gill rakers slender, 2 in orbit, 15 on horizontal limb of first arch. Bones of head thin and flexible. No distinct orbital or postorbital spine.

Scales thin, cycloid, not serrated, moderate, those of lateral line not enlarged; 3 in a transverse series between lateral line and origin of dorsal. Cheeks, opercles, and interorbital space scaly.

Photophores.—Mandibulars 3 pairs, operculars 2, the upper apparently double, the lower minute, behind angle of jaw; pectorals 3, the uppermost above opercular lobe at lower edge of second or third scale of lateral line, the second in front of middle of base of fin, and the third midway between this and the foremost thoracic spot, the three forming an obtuse angle at base of pectoral fin. Thoracic 5, the first and second pairs far apart, the fourth pair almost directly outside of the third. Supraventral 1, about midway between lateral line and base of ventral fin; ventrals 5, the first pair close together between bases of ventral fins; the first three equidistant and forming a straight line diverging backward from midventral line; supraanals 4, one immediately under lateral line and forming with two others a straight line extending obliquely downward and forward, the fourth a little above and in front of the first anterior anal spot; anterior anals 5, equidistant, the last three forming a gentle curve upward toward the postero-lateral; postero-lateral 1, under lateral line and a very little behind the hindermost anterior anal; posterior anals 5, equidistant; caudals 4, equidistant, in a gentle curve with the concavity forward. The spots are divided by a black septum. Anteorbital gland, orange-colored: a triangular or heart-shaped portion of it at the antero-dorsal angle of orbit; within and below this the organ occupies the entire area between orbit and middle line down to nostrils and between orbit and maxillary backward to about the vertical from the center of the eye.

Distance from tip of snout to origin of first dorsal and to base of ventrals $2\frac{2}{5}$ in length of body, from tip of snout to origin of anal $1\frac{2}{3}$, base of dorsal $4\frac{1}{2}$ to 5, base of anal 6, from root of pectorals to root of ventrals $6\frac{1}{4}$ in length of body. Pectorals inserted low, below the line

through lower rim of orbit and a little above the line from angle of mouth to root of ventrals; the fin narrow, weak, its length $2\frac{1}{2}$ in head. Ventrals broad, stronger. Caudal deeply forked.

Color (in alcohol).—Body blackish brown (where the scales have disappeared). A spot at base of each ventral fin, and a pair of spots on interorbital space over the eye and the anterior rim of orbit, jet black. Top of head and opercles, gill and mouth cavities, blackish. Scales silvery, iridescent. Peritoneum black.

Twelve specimens, 3 to $3\frac{3}{4}$ inches long, from station 286 (surface tow net, lat. N. $21^{\circ} 15' 49''$, long. W. $157^{\circ} 44' 27''$); and from Iiao Makanni.

Type.—No. 47710, U.S.N.M.

This species differs from *Diaphus theta* and *D. engraulis* in the extreme development of the preocular photophore.

MYCTOPHUM FIBULATUM, new species.

(Plate XXXVIII, fig. 3.)

Head $3\frac{1}{10}$; depth $4\frac{1}{4}$. D. 12; A. 19; P. 16; V. 8; pores of lateral line about 27 or 28.

Body compressed, its width about 2 in its depth. Least depth of peduncle $2\frac{2}{3}$ in greatest depth of body. Dorsal and ventrals outlines nearly similar, the depth of body a little greater at origin of first dorsal than at the nape. The peduncle somewhat expanded at base of caudal fin. Head stout, compressed, its dorsal outline parabolic, its greatest width about $1\frac{2}{5}$ in its greatest depth, its width at anterior rim of orbit $2\frac{1}{2}$ in the greatest depth. Orbit large, circular, $2\frac{3}{4}$ in head, its upper rim nearly entering profile. Interorbital space nearly flat, broad, $1\frac{1}{2}$ in orbit. Snout steep, blunt, short, 2 in orbit, its tip a little above the level of the lower edge of the pupil. Mouth somewhat oblique, maxillary $1\frac{2}{3}$ in head, reaching about one-fourth or one fifth of its own length beyond the posterior rim of the orbit. Teeth very small, in narrow bands on the jaws and palatines. Lower jaw with a very small symphyseal knob, the sharp edges of the rami meeting in a slight ridge in the median ventral line. Nostrils nearly midway between tip of snout and anterior rim of orbit, about on a level with the center of the eye, the two openings very close together and nearly equal in size. Orbital margin separated by a groove and a ridge from the preopercle. Posterior preopercular margin somewhat rounded (injured), extending obliquely upward and forward. Opercle with a broad, rounded upper angle and a small pointed triangular projection just above the base of the pectoral fin, which it reaches. Bones of skull thin and flexible. About 18 gill rakers on anterior limb of first arch, slender, long, 2 in orbit. Scales large, thin, cycloid, deciduous (nearly all gone from the single specimen except those of the lateral line and those with phosphorescent spots). Interorbital space, snout, and lower jaws naked. Cheeks and preopercle with very thin scales.

Photophores.—Mandibular, 3 pairs in a curved line; operculars 2, the upper elongated vertically and on a level with lower rim of orbit; pectorals 3, forming an acute triangle, the uppermost high up, on a level with the lateral line, another at lower base of pectoral, and the third in front of and a little below the second; thoracic 5, the anterior pair very close to middle line, the first 4 pairs nearly equidistant, the spots of the fifth pair far apart, separated by entire width of base of ventrals; supraventral 1, high up, its distance below lateral line about 3 in orbit; ventrals 3, nearly equidistant; supraanals 4, in an elegant curve, concave upward, the foremost a little above and behind the base of ventral fin, the hindmost immediately under lateral line, a very little behind first anterior anal spot; anterior anals 6, equidistant except the first and second, which are a little farther apart; posterior anals 4, equidistant, the distance between first posterior anal and last anterior anal equal to distance between first and second anterior anals; posterior lateral 1, immediately under lateral line and over last anterior anal; caudals 2, the distance between them equal to distance between anterior caudal spot and the hindermost spot of posterior anal series. Photophores not divided into halves by dark bands. A small glandular patch on back of peduncle immediately in front of rudimentary caudal rays. Postorbital part of head 2 in its whole length. Origin of first dorsal midway between tip of snout and anterior rudimentary caudal rays. Distance between dorsals very little greater than distance between origin of anal and base of ventrals; from tip of snout to base of ventrals a little less than from tip of snout to origin of dorsal. Base of dorsal about $2\frac{1}{4}$, base of anal $1\frac{2}{3}$ in head. Rays of all the fins more or less injured; pectorals narrow, slender, very long, reaching about to origin of anal.

Color (in alcohol).—Scaleless parts of skin dusky to blackish brown. Scales silvery, steel blue, iridescent; cheeks and opercles silvery, iridescent. Snout whitish. Base of caudal and anal and upper rays of pectoral blackish; ventrals, lower short rays of pectoral, and distal part of anal white; caudal, first dorsal, mouth cavity, and anterior part of gill cavity dusky. Adipose dorsal white, black at base. Peritoneum black.

One specimen, 4 inches long, from station 3467; 310 fathoms.

Type.—No. 47711, U.S.N.M.

DASYSCOPELUS PRISTILEPIS, new species.

(Plate XXXIX, fig. 1.)

Head $3\frac{2}{3}$; depth $4\frac{1}{4}$. D. 12 to 13; anal 18; pectoral about 17; ventrals 8; lateral line (pores) 35 to 38.

Body elongate, compressed, heavy in front, its greatest width (over the pectorals) $1\frac{1}{2}$ in the depth. Depth at nape and at origin of first dorsal equal; thence to the caudal the dorsal outline descends gently and regularly, while the ventral outline ascends more rapidly

under the base of the anal than elsewhere. Least depth of peduncle about 3 in depth of trunk. Head heavy, compressed, its greatest width about $1\frac{1}{2}$, its width at anterior rim of orbit 3, in its greatest depth. Orbit large, circular, $2\frac{1}{3}$ in head, far forward, its dorsal rim nearly entering the profile. Interorbital space broad, nearly flat, narrower forward, its width above center of eye about 3 in head. Snout steep, very short, bluntly rounded, its tip nearly on a level with the lower edge of pupil. Nostrils on a level with center of eye, the posterior much larger, close to the anterior rim of orbit. Mouth oblique, the gape slightly curved, maxillary $1\frac{3}{5}$ in head, reaching to vertical from posterior rim of orbit. Narrow bands of villiform teeth on jaws; minute asperities on vomer and palatines. Posterior edge of preopercle nearly vertical. Opercle thin, its posterior margin rounded with only a slight, blunt point. Gill rakers slender, about $2\frac{1}{3}$ in orbit, about 17 on horizontal limb of first arch. Scales large, firm; their edges strongly toothed, the teeth entirely absent or obsolescent on scales of lateral line. Scales of lateral line and of the trunk below it with the vertical diameter much greater than the horizontal. Large scales on cheeks and opercles, 2 in a transverse series between lateral line and origin of first dorsal.

Photophores.—Mandibulars 3 pairs, operculars 2, the lower one small, opposite angle of jaws; pectorals 3, forming an isosceles triangle with the apex directed backward, the upper spot a little above and in front of base of pectoral, the middle one immediately under base of pectoral, and the third nearly midway between this one and the first thoracic spot; thoracic 5, nearly equidistant, the hindermost in front of external end of base of ventral fin; supravental 1, midway between ventral fin and lateral line; ventrals 4, equidistant; supra-anals 3, in a gently curved line, with the concavity forward, nearly equidistant, the lowermost above the hindermost ventral spot, the uppermost immediately under lateral line; anterior anals 8, equidistant, in a nearly straight line; postero-lateral 1, under lateral line and above last supraanal spot; posterior anals 4, equidistant; caudals 2, close together near ventral profile. Each of the spots surrounded by a broad, black rim, but not divided into two halves by a black septum. Distance from tip of snout to origin of dorsal $2\frac{2}{5}$; to root of ventrals $2\frac{2}{7}$; from root of ventrals to origin of anal 6; base of anal 4; base of dorsal 6 to 7 in length of body. Pectoral fin a little below the level of center of eye, narrow, slender, the longest rays about 5 in length of body. Ventral rays strong (broken off). Anterior anal rays much stronger and longer than the posterior; dorsal rays in a groove formed by elongate scales. Caudal deeply forked.

Color (in alcohol).—Back and top of head blackish; sides, opercle, and cheek, and under side of lower jaw silvery; all the scales with metallic luster; snout yellowish white. Gill and mouth cavities blackish, first dorsal and caudal fins dusky, the others pale. Peritoneum blackish brown.

Two specimens, $2\frac{1}{2}$ inches long, from station 286 (surface tow net, lat. N. $21^{\circ} 15' 49''$, long. W. $157^{\circ} 44' 27''$).

Type.—No. 47737, U.S.N.M.

NEOSCOPELUS MACROLEPIDOTUS, Johnson.

Nine specimens, 4 to $8\frac{1}{2}$ inches long, from stations 3470 and 3474; 343 and 375 fathoms respectively.

Taken heretofore at Madeira (Johnson) and Kermadec Islands (*Challenger*).

Family MAUROLICIDÆ.

ARGYRIPNUS, new genus.

Body much compressed, oblong or elongate, passing gradually into the slender tail, covered with very thin, flexible, cycloid, deciduous scales. Head longer than deep, without spines, its bones thin and flexible. Maxillary sickle-shaped, with spatulate supplemental bone. Eye large. Dorsal fin on middle of back, without anterior spinous dilatation. A large (double) luminous organ on preopercle and series of equidistant organs on branchiostegals, isthmus, breast, abdomen, and lower part of side. A continuous series from above base of ventral fin to about the end of the anterior third of the base of the anal fin. A closely set series of five spots above middle of anal fin, and another series of fifteen beginning above hinder end of anal and extending to the anterior rudimentary rays of the caudal.

ARGYRIPNUS EPHIPIATUS, new species.

(Plate XXXIX, fig. 2.)

Head a little more than 3; depth $3\frac{3}{4}$. D. 10; A. 22; P. 15.

Body strongly compressed, its width $2\frac{2}{3}$ in the greatest depth. Dorsal and ventral outlines nearly similar, but the former descends more rapidly under the dorsal fin than elsewhere and the latter ascends a short distance very abruptly behind the base of ventral fins. Depth of body at the nape and at origin of dorsal fin equal; least depth of peduncle 3 in greatest depth of body. Head compressed, its greatest width (behind the orbit) 2 in its greatest depth; its dorsal and ventral profiles similar, strongly curved. Orbit large, $2\frac{1}{4}$ in head, circular, its upper margin entering profile. Interorbital space (somewhat crushed in the single specimen) about $5\frac{1}{2}$ in head. Snout broad, short, about 2 in orbit, its tip on a level with center of eye. Mouth wide, very oblique anteriorly. Premaxillary slender, nearly as long as orbit, forming an angle of about 45° with axis of body, its lower end reaching about to the vertical from anterior margin of orbit. Maxillary reaching very nearly to posterior margin of orbit, somewhat sickle-shaped, with a rather sharp curve opposite the lower end of the premaxillary, and slightly overlapped at its posterior end by its spatulate supplemental

bone. Lower jaw entirely included laterally, and concealed by the overhanging maxillary, curved upward anteriorly, its tip entering profile. Teeth on premaxillary, maxillary, mandible, and palatines, few, in single series, sharp and slender; a tooth on each premaxillary about midway of its length, the anterior tooth of the palatine series and one or more at the side of the lower jaw longer than the rest. Tongue broad, free in front. Preopercular edge nearly vertical. Gill membranes not united. Pseudobranchiæ large. Gill rakers long, $2\frac{1}{2}$ in orbit, 15 on anterior limb of first arch. Bones very thin and flexible, the usual deep-sea characters prominently developed. Scales large, very thin and flexible, cycloid, highly deciduous, nearly all lost in the type specimen, which is here figured as it appears, scaleless with conspicuous muscular impressions.

Phosphorescent organs.—Two on opercle below the level of the orbit, one above the other, at the two ends of a short vertical steel-blue band from which they are separated by small black cross bands; one on cheek immediately behind tip of maxillary; 5 oblong (vertical) spots on branchiostegal membranes; a curved row of 6 nearly circular spots from base of pectoral to anterior end of isthmus; a nearly straight row of 10, equidistant, circular and smaller, on each side of middle line, beginning at humeral symphysis and running along abdomen to front of base of ventrals; a series of 7 oblong, vertical organs, yellowish at the lower and pearl-colored at the upper end, farther up on the side, on a level with the pectoral fin; immediately behind this, over the root of the ventral fin, begins a series of 19 organs which gradually become smaller posteriorly, and runs gently dorsalward to origin of anal, then rises a little higher with an abrupt curve and continues horizontally to about the end of the anterior third of base of anal; behind this a series of 5 small organs above the middle of anal; a series of 15 very small organs begins just in front of the end of the anal and extends along its base and close to the mid-ventral line of the caudal peduncle to the root of the anterior caudal rudiments; probably one in front of and one behind the orbit (injured.)

Distance from tip of snout to origin of dorsal $2\frac{1}{4}$ in length of body, from tip of snout to root of ventrals $2\frac{1}{7}$, to origin of anal $1\frac{3}{8}$, length of base of dorsal 7, base of anal $3\frac{1}{8}$ in length of body. Vent midway between root of ventrals and origin of anal. Pectoral fin very low, the lower end of its base nearly entering ventral profile, narrow, its longest rays reaching the vent, 4 in length of body. Rays of all other fins badly injured; anterior rays of anal much stronger than the posterior. Origin of anal a little in front of end of first dorsal.

Color (in alcohol).—Snout and most of jaws yellowish white: posterior part of interorbital space, occiput, and back nearly to dorsal fin, upper three-fourths of eyeball, sides of head behind orbit, isthmus, breast, abdomen, areas occupied by the phosphorescent organs, gill and mouth cavities, black. Small black dots at the base of the rays of the

dorsal and the anterior rays of the anal; pectorals dusky, other fins pale; a black area on posterior part of peduncle and two black spots at the base of the dorsal and ventral caudal rays. Peritoneum black.

One specimen, $3\frac{1}{2}$ inches long, considerably injured about head and fins. Station 3472; 295 fathoms.

Type.—No. 47708, U.S.N.M.

Family STERNOPTYCHIDÆ.

POLYIPNUS SPINOSUS, Günther.

One specimen, 2 inches long. Station 3476; 298 fathoms.

STERNOPTYX DIAPHANA (Hermann).

Two specimens, $1\frac{2}{3}$ inches long, from station 3473; 313 fathoms.

Locality.—Atlantic and Pacific. Günther describes two forms of this species. These two specimens belong to the form with larger eye, and the upper part of the mouth conspicuously above the level of the lower margin of the orbit.

MELANOSTOMA ARGYREUM, new species.

(Plate XXXIX, fig. 3.)

Head $2\frac{1}{8}$; depth $3\frac{3}{4}$. D. IX-1, 9; A. II, 7; P. 14, 15; V. I, 5; lateral line 28 to 29 (+2, 3 on tail).

Body elongate, compressed, its width at base of pectorals nearly 2 in the depth. Least depth of caudal peduncle $2\frac{1}{4}$ in greatest depth of body. Head compressed, its greatest width $1\frac{1}{2}$ in the greatest depth. Dorsal and ventral profiles convex, similar. Orbit large, 3 to $3\frac{1}{4}$ in head, interorbital space convex, its width a little less than orbit, divided into areas by a series of low, thin ridges; one of these, not quite as long as the snout, extends forward along the median line of the occiput to about the vertical from the posterior margin of the orbit; on each side of this, a little behind its anterior end, begins a curved ridge which runs forward and outward to about the vertical from the hinder edge of the pupil and thence forward and inward to the median line between the anterior nares, these symmetrical ridges forming a pear-shaped figure with its pointed end directed forward; on each side, at the greatest convexity of the above ridges, at the vertical of the posterior margin of the pupil, begins another ridge which runs straight forward and outward close to the antero-dorsal margin of the orbit, then curves inward and forward inside of the nares to a point in advance of the anterior nares and not far from the middle line.

Snout $1\frac{1}{3}$ in orbit, its tip about on a level with the lower margin of the pupil. Posterior nares narrow, vertical slits close in front of rim of orbit, on a level with upper rim of pupil; anterior nares small, circular; the distance between the posterior and anterior nares 5 in orbit.

Jaws equal, or the lower very slightly projecting, entering the steep profile. Maxillary with a ridge along the middle, reaching to or a little beyond center of eye, $2\frac{1}{4}$ in head, much expanded behind, the end emarginate, the lower posterior angle somewhat enlarged into a lobe. Small teeth in bands on jaws, vomer, and palatines; a large canine tooth inside of the band of small teeth near the anterior end of each premaxillary, the tip of the lower jaw fitting between them. Each ramus of the lower jaw with 9 canine teeth in a single series; 2 very close together, at each side of the tip of the lower jaw; just outside of these a depression in the jaw into which fits the canine of the upper jaw; behind this 7 nearly equidistant teeth, of which the most anterior is the smallest and the fourth largest or as large as those behind it. The small teeth outside of the row of canines, very few in number in the lower jaw. The canines sometimes as few as 5 in number on each side. Suborbital ring narrow. Posterior edge of preopercle nearly vertical and straight, directed a little downward and backward and very slightly curved backward near its posterior end, producing a prominent rounded angle. Both edges closely serrated, the serrations strongest, almost in the form of small spines, at the angle. The ridge of the preopercle forms a rounded and obtuse but marked angle, its inferior edge serrated. The opercle with two slightly diverging ridges, the lower nearly horizontal and a little more strongly developed than the upper, both ending in small spines. Gill rakers 13 on the anterior limb of first arch, the longest about 3 in eye. The lateral line is high up, and continued onto the basal part of the caudal fin. Scales large, thin, cycloid, very deciduous; 2 in a transverse series between the lateral line and the origin of first dorsal fin. Interorbital space, snout, and lower jaw, and apparently the maxillary and opercles scaleless. Cheeks with large, thin, embedded scales. Second dorsal, anal, and caudal scaly on their basal parts. The origin of the first dorsal fin is over the root of the pectoral, its third spine probably the longest, at least half as long as head, the spines slender and weak. Origin of second dorsal a little in front of origin of anal, the rays heavy. The first spine of the anal fin short, the second longer, $1\frac{1}{2}$ in orbit, the soft rays thick. Caudal deeply forked, the longest rays at least half length of head. The ends of the rays of second dorsal, of anal, and caudal all injured. The upper end of root of pectoral about on a level with lower edge of pupil, the width of the base less than half orbit, the longest rays (injured at tips) at least two-ninths of body length. Root of ventrals under root of pectorals. Spine of ventral fin long, $2\frac{1}{2}$ in head, its outer edge densely serrate, the soft rays more than half as long as head. Distance from tip of snout to origin of first dorsal $2\frac{2}{3}$ in length of body, from tip of snout to origin of anal a little more than $1\frac{1}{2}$; from root of ventrals to origin of anal $3\frac{1}{3}$, base of first dorsal $5\frac{1}{2}$, base of second dorsal $8\frac{1}{3}$, distance between dorsals 10, base of anal 9, in the body length.

Color (in alcohol, scales nearly all off).—Back and upper part of sides light brownish, with black lines at the edges of the fallen scales. Top of head and snout dusky. Sides of head and lower three-fifths of trunk and tail silvery. First dorsal fin blackish in the distal half; the other fins a little dusky. Mouth cavity not dark; gill cavity a little dusky. Peritoneum black.

A second, smaller specimen differs from the type in having only 5 instead of 9 canines in each lower jaw, its depth is a little greater, orbit larger, gill rakers a little shorter. Aside from some very slight differences in the proportions, it agrees in even minutest details with the type.

In some respects close to *Melanostoma japonicum*, Steindaechner and Döderlein, differing from it, among other characters, in its serrated ventral spine, larger number of canine teeth, greater length of second anal spine, in the color, the relative development of the two opercular ridges, and the absence of black color in the mouth cavity.

Two specimens, $3\frac{3}{4}$ and $5\frac{1}{2}$ inches long, from stations 3472 and 3476; 295 and 298 fathoms, respectively.

Type.—No. 47732, U.S.N.M.

Family SCORPÆNIDÆ.

SCORPÆNA REMIGERA, new species.

(Plate XL.)

Head $2\frac{1}{4}$ to $2\frac{3}{4}$; depth $2\frac{5}{7}$. D. XII, 10; A. III, 5; P. 21; V. I-5; lateral line 29 (pores), the number of scales much larger, not to be exactly counted.

Body ovate, deep, strongly compressed, its width $2\frac{1}{5}$ in its depth. Least depth of the peduncle $4\frac{1}{3}$ to 5 in greatest depth of body. Head compressed, its width $1\frac{1}{2}$ in its greatest depth; its profile steep, nearly straight. Bones of skull thin, cavernous. Orbit moderate, nearly circular, 4 in head. Interorbital space flat, with a pair of prominent oval mucous openings, and behind these a larger median triangular depression covered by a thin membrane. Snout about equal to orbit. Spines of head small and sharp. Preorbital with three divergent spines, the first directed forward, the second forward and downward, and the third downward and backward. Suborbital stay rather prominent, cavernous, with usually a minute spine near its posterior end. Small preocular, supraocular, occipital, and paroccipital spines present. Occipital ridges thin but evident. Preopercular spines divergent 5, the 3 upper long and sharp, second usually longest, the 2 lower small or obsolete. Opercle with two diverging ridges, the lower nearly horizontal, the upper directed upward toward the tip of the opercular lobe, both ending in sharp spines. Mouth large, but little oblique, the tip of the upper jaw about on a level with the lower rim of orbit; the maxillary 2 in head, reaching a little beyond pupil, its posterior end dilated, $1\frac{2}{3}$ in

orbit. Narrow bands of villiform teeth on premaxillary and mandible; a few teeth on vomer; a very few on anterior part of palatines. Lower jaw not projecting, its tip fitting into a small notch between premaxillaries. Small pseudobranchiæ present. Gill lamellæ small; rakers far apart, rather slender, the longest about $2\frac{1}{2}$ in orbit, 9 to 10 on the anterior limb of first arch. Scales very small, cycloid, somewhat deciduous, 10 to 11 in a transverse row between lateral line and origin of spinous dorsal. Cheeks and opercles scaly. Interorbital space, snout, and jaws naked. Pectoral fin broad, its base 3 in depth of body; some of the upper rays branched, the lower rays not procurent or thickened, the middle rays longest, equal to depth of body, or $2\frac{5}{7}$ in its length, reaching to or nearly to the end of the base of the anal fin. Ventral fin under the pectoral, 4 in length of body, reaching nearly to vent, the spine long and strong, $1\frac{1}{3}$ in the soft rays, the interior ray attached for half its length by a membrane to the body wall; anal spines slender, graduated, the first 2 to $2\frac{1}{2}$ in the third, the third equal or nearly equal to the ventral spine and a little shorter than the soft anal rays. Dorsal spines slender, sharp, the fourth spine longest, twice as long as the first; the eleventh very small, one-third as long as the first; the twelfth long, apparently belonging to the second dorsal fin, $1\frac{3}{4}$ in the fourth spine; the soft rays about equal to the longest spine. Caudal fin slender, the median rays longest. Distance from tip of snout to origin of spinous dorsal $2\frac{1}{3}$ in body; from tip of snout to root of pectorals $2\frac{1}{2}$, and to origin of anal $1\frac{1}{3}$, from root of ventral to origin of anal 3, in length of body. Base of soft dorsal a little more than two in spinous dorsal; total length of soft and spinous dorsals two in length of body. Length of anal base $3\frac{2}{3}$ to 4 in head. Mucous system highly developed. No dermal flaps. Vent just in front of anal fin.

Color reddish. Skin everywhere densely dotted with minute black specks; edge of spinous dorsal and base of soft dorsal, basal third of anal fin, the ventral fins, a ventral median band from root of ventrals to origin of anal, a spot with indefinite outlines under spinous dorsal, another under soft dorsal and a fainter one at posterior end of peduncle, the gill cavities and the posterior part of the mouth cavity, and the alimentary canal blackish or blackish brown. The external blackish areas are aggregations of dark dots. Peritoneum mostly silvery.

Three specimens, $3\frac{1}{4}$ to $4\frac{1}{4}$ inches, from station 3476; 298 fathoms.

Type.—No. 47726, U.S.N.M.

Family TRIGLIDÆ.

PERISTEDION HIANS, new species.

(Plate XLI, figs. 1, 2.)

Head (from front of premaxillaries) $2\frac{2}{3}$; depth $6\frac{1}{3}$. D. VII-22; A. 22; P. 17 (2, 15); lateral line about 34 (pores).

Body covered with 8 series of spongy, bony plates armed with sharp,

thin, recurved spines. One pair of plates between occiput and origin of first dorsal, their spines smaller than the following ones; 30 plates in the dorsal series, their spines nearly obsolete on the caudal peduncle. The superior lateral series with 34 plates, of which the 4 or 5 anterior ones are smaller, with smaller spines, and forming a decurved line from upper angle of opercle. Beginning with the fifth, the plates larger, with the largest spines on the body. Those of the succeeding plates decreasing regularly backward. The pores of the lateral line open below and behind the spines of this series. A space behind pectorals naked; behind this, about at the beginning of the distal third of pectoral fin begins the inferior lateral series of 25 plates. Twenty-six plates in the ventral series, the foremost pair about twice as long as wide, their length about five-sevenths of depth of body. Two pairs of plates of this series in front of vent, the spines of this series mostly weak, obsolete behind.

Greatest width of head about 3 to $3\frac{1}{2}$ in length of body (from tip of premaxillaries). Edge of suborbital ridge slightly denticulate without spines or prominent lobes laterally, terminating behind in a long, slender spine about as long as preorbital projection. Above this are smaller spines, varying in number from one to three. Opercle with one moderate ridge ending in a small spine and above this another nearly obsolete ridge without spine. Preorbital projection triangular, rounded at tip, about equal to interorbital space, $3\frac{1}{4}$ in distance from tip of projection to front of orbit. Orbit 4 in head. Interorbital space concave, about 5 in head, with two slight longitudinal ridges diverging backward to base of supraocular spine, thence downward and outward behind orbit continuous with the slight paroccipital ridge, which ends in a small spine. Supraocular spines short, mostly blunt, occipital spines larger, compressed, rather sharp. Width of mouth about $2\frac{1}{2}$ in head; distance from tip of lower jaw to tip of premaxillaries nearly equal to interorbital space, posterior angle of lower jaw reaching beyond anterior third of orbit. The jaw armed on the outer side posteriorly with two flat, finely spinulous plates. Two similar plates behind angle of jaw. Teeth none. Seven small barbels at each side of jaw anteriorly and two on its inner side close together and farther back. The large barbel, reaching to or beyond vent, provided on its anterior margin with a fringe of smaller barbels. The longest gill rakers about 4 in orbit. Ventrals reaching vent. Pectorals reaching beyond origin of anal, the upper free ray nearly as long as longest pectoral ray.

Color (in alcohol).—Head somewhat dusky; first dorsal, pectorals, and ventrals blackish, paler at base; axils dusky; second dorsal with a narrow black edge anteriorly. Peritoneum black. Length 7 inches. In a young specimen the dark coloring more marked, the distal half of the long barbel blackish, the spines sharper; edge of suborbital ridge with two small but marked triangular projections on the lines of

posterior suture of preorbital and the anterior suture of preopercle. The upper spine of preopercle minute. Head relatively longer: depth $5\frac{1}{2}$.

Twelve specimens, 4 to $7\frac{1}{2}$ inches, from stations 3470, 3472, and 3476; 343, 295, and 298 fathoms, respectively.

Type.—No. 47730, U.S.N.M.

Family MACROURIDÆ.

CÆLORHYNCHUS PARALLELUS, Günther.

One specimen, $4\frac{3}{4}$ inches long, from station 3473; 313 fathoms. Taken by the *Challenger* off New Zealand, Kermadec Islands, and Japan.

CÆLORHYNCHUS GLADIUS, new species.

(Plate XLI, fig. 3.)

Head $3\frac{3}{4}$; depth $9\frac{1}{2}$; B. 6. First dorsal I, 10 to I, 11; second dorsal quite well developed anteriorly, its longest rays nearly equal to interorbital space; anal rays delicate, slender; pectorals 18; ventrals 7.

Top of head evenly rounded, both transversely and longitudinally. Snout depressed, turned upward (its dorsal profile concave), very long, narrowed anteriorly, its tip produced as a long, strong, horny spine; length of snout, including spine, more than half head, the spine about one-third of the entire snout. The strong infraorbital ridge begins at the base of the rostral spine and extends in a nearly straight line downward, outward, and backward far beyond orbit, to the angle of the preopercle. Interorbital space very nearly equal to long diameter of orbit. A pair of minute parallel spiny ridges on occiput, another extending backward as a continuation of the upper orbital rim to above upper angle of gill opening. Orbit large, oblong, its vertical diameter much less than the longitudinal, the latter $1\frac{1}{4}$ in the postorbital part of head, about $4\frac{3}{4}$ in the whole head. Mouth small, entirely inferior, the maxillary reaching to about the middle of the orbit or a little beyond. Distance from tip of snout to front of premaxillaries very slightly less than length of snout and a trifle less than one-half length of head. Width of mouth equal to longitudinal diameter of orbit. Teeth in narrow bands on both jaws, none of them enlarged. Angle of preopercle a little produced, the posterior edge of preopercle nearly straight, directed upward and forward. Barbel minute, slender, about $3\frac{1}{2}$ or 4 in the orbit. Gill membranes united, joined to the isthmus without free fold behind. Anterior gill slit only a small pore-like opening. Body compressed throughout, its greatest width $1\frac{1}{4}$ in its depth; trunk and tail tapering uniformly. Scales of moderate size, 6 or 7 scales in a transverse series between the lateral line and origin of first dorsal; scales from the back near first dorsal fin with about 20 to 25 small spinelets in usually 7 nearly parallel series, one from back in front of first dorsal with 11 spinelets in 5 series; another from ventral surface near origin of anal fin with 19 spinelets in 6 series; another from breast

with 10, rather irregularly arranged. All of the dorsal and lateral surfaces of head densely scaled; ventral surface of head and snout naked. A narrowly elliptical pit on median line in front of base of ventrals, naked in the young, covered with cycloid scales in adults. Second dorsal spine slender, not much prolonged beyond the rest, apparently smooth, but with 2 excessively minute spinelets, and 2 still more minute knobs, all placed considerable distances apart. Base of first dorsal nearly equal to interorbital space; distance between dorsals only one-third interorbital space. Pectorals narrow, 2 in head exclusive of rostral spine. Outer ventral ray somewhat elongated into a filament, nearly as long as pectorals, not reaching origin of anal. Distance from vent to isthmus about $1\frac{1}{4}$ in head exclusive of rostral spine; from base of ventrals to origin of anal, 2 in head; vent immediately in front of anal fin.

Color (in alcohol).—Light brownish, head a little dusky. A large round, black spot immediately above and behind base of pectoral fin. A broad, faint, cross band above origin of anal fin, and four other fainter ones on the tail. A small, round, brown spot on middle of occiput. Ventral part of trunk brownish black. Branchiostegal membranes with minute dark specks. First dorsal fin white, its anterior rays broadly black-margined. Ventrals white.

In a young specimen, $2\frac{3}{4}$ inches long, the rostral spine is only a small but well-marked flexible point; hence the head relatively shorter, $3\frac{1}{2}$ in total; scales very deciduous, their spinelets fewer, relatively longer and more slender; first dorsal spine with 3 or 4 very minute knobs or rudiments of spinelets. The spinelets on the characteristic ridges of the head sharp. Outer ventral ray much prolonged, reaching far beyond origin of anal; the color bands more marked. Distance from vent to base of ventrals less than one-half length of head (abdomen shorter than in adult).

Four specimens, $2\frac{1}{2}$ to $6\frac{3}{4}$ inches long, from station 3472; 295 fathoms.
Type.—No. 47706, U.S.N.M.

CŒLOCEPHALUS, new genus.

CŒLOCEPHALUS ACIPENSERINUS, new species.

(Plate XLII, fig. 1.)

Head about $4\frac{2}{5}$; depth $6\frac{3}{4}$ to 9; B. 7. First dorsal 1, 10 to 1, 11; second dorsal low; anal rays well developed; pectorals, about 22 to 24; ventrals, 8 to 9. Snout much depressed, flat, thin, projecting horizontally much beyond the mouth, its tip formed by a bifid, spinigerous tubercle, its length $2\frac{2}{5}$ in head, its lateral edges fringed with a thick, spinigerous roll of integument, extending backward to and contiguous with the prominent infraorbital ridge, which extends to below the posterior rim of the orbit and divides the cheek into an upper somewhat sloping and a lower nearly horizontal part. A small, bony prominence

nearly midway of this lateral ridge, in front of nostrils. Interorbital space flat between the two slightly raised orbital rims, about equal to vertical diameter of orbit. Orbit large, the longitudinal much greater than the vertical diameter, the former $3\frac{3}{4}$ to $3\frac{3}{4}$ in head.

Mouth small, wholly inferior, the distance from tip of snout to premaxillaries contained $2\frac{3}{4}$ times in length of head; the middle of cleft of mouth slightly behind middle of head, the maxillary reaching about to the middle of eye; its length one-third of snout and eye. The teeth in villiform bands in both jaws, none of them enlarged. Angle of preopercle a little prolonged into a lobe, the posterior margin directed upward and forward. Barbel minute, about 5 in orbit. Gill membranes broadly united, with a moderate free fold behind.

Body compressed, its width only about one-half its depth. Base of first dorsal oblique, its origin well elevated above general profile. Scales with 15 to 20 spinelets in about 4 to 6 parallel series. Scale from interorbital base with about 40 spinelets in about 9 radiating series. About 7 scales in a transverse series between lateral line and origin of first dorsal. Interorbital space, upper side of snout, and infraorbital ring scaly; entire lower side of head, including under side of snout and suborbital region, naked. Second dorsal spine a little curved, sharply serrate, prolonged into a filament, $1\frac{3}{4}$ in head. Base of first dorsal less than interorbital space; distance between dorsals less than twice the base of the first dorsal. Pectorals near axis of body, slender, 2 to $2\frac{3}{4}$ in head. Inner ventral rays reaching about to origin of anal, the outer ray prolonged into a filament nearly twice as long as the inner rays. No naked pit between bases of ventrals. Distance from vent to isthmus, $2\frac{1}{2}$ in length of head. Distance from vent to origin of anal but half its distance from base of ventrals.

Color (in alcohol).—Light brownish; snout and anterior part of head translucent whitish. Inside of mouth, gill cavities, and abdomen blackish. Fins dusky. Peritoneum brownish black dorsally, silvery ventrally.

Twenty-one specimens, $4\frac{1}{2}$ to $7\frac{1}{4}$ inches long, from stations 3470, 3471, 3473, 3474, 3475, and 3476; 343, 337, 313, 375, 351, and 298 fathoms, respectively.

Type.—No. 47721, U.S.N.M.

The new genus *Cælocephalus* differs from *Cælorhynchus* only in having the second dorsal spine serrate. It is of doubtful value, especially in view of the rudimentary serræ present on the second dorsal spine of *Colærhynchus gladius*.

MACROURUS ECTENES, new species.

(Plate XLIV, fig. 1.)

Related to *M. rudis*.

Head $7\frac{1}{3}$; depth about $9\frac{1}{2}$. First dorsal I, 10; second dorsal low; pectorals about 22; ventrals 9.

Head compressed, deep, its sides vertical. Snout short, $1\frac{2}{3}$ in orbit,

scarcely extending beyond mouth, its anterior profile subvertical, its tip distant from premaxillaries one-half length of orbit. Tip of snout a small prominent spinigerous tubercle; a much smaller tubercle at each side of it. A median ridge extends backward from the tubercle to about the middle of the interorbital space, and at each side a smaller ridge from the minute lateral tubercles, above the nostril and coalesces with the superior orbital rim. A small spineless groove between the median and each of the lateral ridges. Interorbital space $1\frac{3}{5}$ in orbit, flat or a little concave. Orbit very large, $2\frac{2}{5}$ in head, elliptic in shape, its greatest diameter obliquely downward and backward. Mouth small, maxillary reaching about to front of pupil, one-half length of snout and eye. Teeth in villiform bands in both jaws. Angle of preopercle not produced backward. Barbel small, scarcely half the diameter of orbit. Gill membranes rather broadly united, with a narrow free fold behind. Anterior gill slit very short, about 3 in diameter of orbit. Body compressed, its width about one-half its depth. Tail very slender. Scales somewhat deciduous, small, very thin and flexible, with 3 or 4 slender, flexible spinelets (on a scale from side of back, near first dorsal fin). Scales on cheeks and top of head with from 1 to 3 spines in a single series, those on opercles with about 8 or fewer spines, usually in 3 parallel series. Spines on head shorter, suberect. About 10 or 11 scales in a transverse series between lateral line and origin of first dorsal. Interorbital space, upper side of snout, infraorbital ring, cheeks and opercles, scaly. Second dorsal spine serrate. Base of first dorsal a little greater than interorbital space. Interspace between dorsals short, about equaling base of first dorsal. Pectorals $1\frac{3}{5}$ in head. Outer ventral rays elongated (but broken off in the single specimen). Distance from tip of snout to origin of anal only twice the depth. Origin of anal under middle of first dorsal; its distance from base of ventrals five-sixths diameter of eye. Distance from vent to isthmus about half length of head, vent nearer anal than ventrals.

Color (in alcohol).—General color brownish black. Abdomen jet black. Mouth and gill cavity dusky or blackish. Fins dusky. Peritoneum black.

One specimen, $5\frac{1}{4}$ inches long, from station 3473; 313 fathoms.

Type.—No. 47718, U.S.N.M.

MACROURUS PROPINQUUS, new species.

(Plate XLII, fig. 2.)

Head $5\frac{1}{5}$ to $5\frac{3}{5}$; depth $6\frac{1}{2}$. B. 7. First dorsal 1, 13; pectorals 21 to 22; ventrals 16.

Head rather large. Snout short, broad, overhanging mouth but little, its anterior profile nearly vertical, its length $1\frac{1}{2}$ in orbit: a small median spinigerous tubercle at the tip and an indistinct one at each side: the median tubercle nearly on a level with upper margin of orbit.

Interorbital space a little convex, about $1\frac{1}{3}$ to $1\frac{1}{4}$ in orbit. Orbit sub-circular, 3 to $3\frac{1}{3}$ in head. Mouth small, transverse, with but little lateral cleft, the maxillary reaching nearly to middle of pupil, about 3 in head. Teeth in both jaws in villiform bands, the outer premaxillary series somewhat longer than those behind, but only indistinctly differentiated from them. Vertical edge of preopercle not serrulate. Barbel moderate, $1\frac{1}{2}$ in orbit. Gill membranes broadly united, almost without free fold behind. Anterior gill slit very short, about one-half diameter of orbit. Width of body about one-half its depth. The dorsal profile rises gently from tip of snout to origin of first dorsal, descending abruptly under this fin, thence nearly straight to end of tail. Ventral outline slightly convex. Scales rather small, quite deciduous, those on upper part of side near dorsal fin with about 25 moderate spinelets arranged in 7 to 8 parallel rows. Fourteen scales in a transverse row between lateral line and origin of first dorsal. The interorbital space, upper side of snout, under sides of rami of lower jaw, infraorbital ring, cheeks, and opercles completely scaled. Second dorsal spine serrate, moderately prolonged in a filament, the length of which can not be given owing to mutilation; base of first dorsal equal to orbit, distance between dorsals three-fourths base of first dorsal. Pectorals near axis of body $1\frac{2}{3}$ in head, somewhat mutilated. Outer ventral ray prolonged into a filament, about as long as head. Distance from tip of snout to origin of anal about 4 in total. Vent about halfway between base of ventrals and origin of anal.

Color (in alcohol).—Brownish; inside of mouth and gill cavities, branchiostegal membranes, and belly black; ventral fin and distal part of first dorsal fin dusky; ventral filament and the other fins pale. Peritoneum silvery, washed with dark brown.

This species differs from *M. holocentrus* in its more numerous ventral rays, smaller scales with fewer and more regularly arranged spinelets, in its dorsal profile, longer barbel, etc.

Two specimens, 6 and $7\frac{1}{2}$ inches long, from stations 3473 and 3475; 313 and 351 fathoms respectively.

Type.—No. 47741, U.S.N.M.

MACROURUS HOLOCENTRUS, new species.

(Plate XLIII.)

Head about $4\frac{2}{3}$; depth about 6; B. 7. First dorsal I, 11 or I, 12; second dorsal low; anal rays well developed; pectorals 20 to 21.

Head quite firm, compressed. Snout very nearly equal to orbit, projecting axially beyond mouth for about half that distance, its lower profile very oblique; in shape obtusely conical, with a median and two smaller lateral spinous tubercles in front, the median tubercle nearly on a level with upper margin of orbit. Interorbital space nearly flat, narrow, $1\frac{1}{2}$ in orbit. Mouth small with lateral cleft. Premaxillaries anteriorly below level of pupil. Maxillary reaching not quite to center

of orbit, about 3 in head. Teeth in villiform bands on both jaws, the outer series of premaxillary teeth longer than the inner, but not canine-like; mandibular teeth smaller. Orbit $3\frac{1}{3}$ in head, its upper margin near the profile. Posterior edge of preopercle nearly vertical, slightly serrulate. Barbel small, scarcely more than one-third diameter of orbit. Gill membranes broadly united with a very narrow free fold behind. Anterior gill slit very short, $2\frac{1}{3}$ to $2\frac{2}{5}$ in diameter of orbit. Body compressed, its width about one-half its depth. Scales of moderate size, not very deciduous, with 25 to 50 very long slender backwardly directed spinelets arranged in about 8 to 10 somewhat irregular parallel series; 9 to 10 scales in a transverse row between origin of first dorsal and lateral line. Interorbital space, upper side of snout, infraorbital ring, under sides of lower jaw, cheeks, and opercles completely scaled. Anterior part of lateral line with a strong convex curve reaching middle of sides slightly in advance of origin of second dorsal. Second dorsal spine serrate, prolonged into a filament, its length slightly less than head. Base of first dorsal much greater than interorbital space, nearly equal to orbit. Distance between dorsals equal to twice the base of first dorsal. Pectorals near axis of body, slender, about $1\frac{1}{5}$ in head. Outer ventral ray prolonged in a slender filament, twice as long as the other rays, which reach origin of anal. Origin of anal nearly under middle of interspace between dorsals. Vent twice as far from origin of anal as from axils of ventrals. Distance from base of ventrals to origin of anal equal to length of snout. A small, round, naked pit between bases of ventrals, its width about one-third diameter of pupil.

Color (in alcohol).—Light brownish, with minute dark punctulations. Lips, branchiostegal membranes, mouth and gill cavities, and lower half of sides of trunk brownish black. Abdomen bluish black. First dorsal and ventral fins blackish, the ventral filament white; basal portion of anterior anal rays, blackish; axil of pectorals black, the fins slightly dusky. Peritoneum silvery, washed and dotted with brownish black.

Three specimens, $6\frac{1}{2}$ to $7\frac{1}{2}$ inches long, from stations 3474 and 3475; 375 and 351 fathoms, respectively.

Type.—No. 47734, U.S.N.M.

MACROURUS GIBBER, new species.

(Plate XLIV, fig. 2.)

Head $6\frac{1}{4}$; depth about $5\frac{1}{2}$; B. 7. First dorsal I, 11 or I 12; second dorsal very low; anal rays well developed; pectorals 20; ventrals 12 to 13.

Head compressed, deep, its greatest depth nearly equal to its length; cheeks vertical. Snout short, but little overhanging the mouth, its length a little less than diameter of orbit; its tip is a small, spiny

tubercle, on a level with the upper rim of the orbit; behind this a median ridge running up on the interorbital space; on each side, in line with the upper rim of the orbit, is another smaller ridge parallel with the median one, and ending anteriorly in a small, spinous tubercle. The infraorbital ridge is nearly vertical and ends under middle of orbit. Space between tip of snout and upper jaw nearly vertical. Interorbital space flat, very nearly equal to horizontal diameter of orbit. Orbit moderate, its longest axis nearly vertical, with a slight obliquity downward and backward, $3\frac{1}{5}$ to $3\frac{2}{5}$ in head. Mouth very oblique, maxillary scarcely reaching front of pupil; the tip of the premaxillaries nearly on a level with the center of the eye. Teeth in narrow villiform bands in both jaws. Angle of preopercle not produced, its posterior edge nearly straight, directed upward and backward. Barbel 1 to $1\frac{1}{2}$ in orbit; gill membranes narrowly nuded, without distinct free fold. Length of anterior gill slit $1\frac{1}{2}$ in orbit.

Body compressed, very deep, its greatest depth at origin of first dorsal equal to or greater than the length of the head. The dorsal profile ascends somewhat to origin of first dorsal, drops abruptly under this fin, which is therefore attached to the posterior slope of a prominent hump, and then runs nearly straight. The ventral profile ascends rapidly backward from origin of anal; hence the tail is abruptly narrower than trunk, but tapers uniformly to its tip. Scales, small, thin, and flexible, deciduous; about 14 in a transverse series between lateral line and origin of dorsal. Scales from back, behind origin of second dorsal, with 13 to 17 small spinelets arranged in about 5 or 6 nearly parallel rows; a scale from back in front of first dorsal with about 9 spinelets in 3 rows. Top and sides of head scaly. Second dorsal spine serrate for about one-third of its length, prolonged into a filament, its whole length $1\frac{2}{3}$ times as long as head. Base of first dorsal equal to orbit, $1\frac{1}{2}$ in the distance between the dorsals. Pectorals slender, three-fourths as long as head. Outer ventral ray prolonged into a filament which reaches much beyond origin of anal, about 2 in head. Origin of anal slightly in advance of origin of first dorsal. Distance from base of ventrals to origin of anal two-thirds of long diameter of orbit. Vent nearer origin of anal than base of ventrals.

Color (in alcohol).—Body brownish; snout light, translucent; lips, mouth cavity, under side of head, and lower side of trunk black. A vertical bar of same color on cheek behind angle of mouth, not reaching the orbit. Lining of gill cover black, with the exception of an oblong space at base of inner branchiostegal ray, which is silvery white. Lining of clavicular portion of gill cavity dusky or whitish. Pectoral and ventral fins dusky. Peritoneum dark brownish, silvery.

Seventeen specimens, $5\frac{1}{2}$ to $8\frac{1}{2}$ inches long, from stations 3474 and 3475; 375 and 351 fathoms, respectively.

Type.—No. 47733, U.S.N.M.

HYMENOCEPHALUS ANTRÆUS, new species.

(Plate XLVI, fig. 2.)

Head $5\frac{3}{4}$ to $6\frac{1}{4}$; depth 8 to $8\frac{1}{2}$; B. 7. First dorsal 1, 9 to 1, 11; pectorals 13 to 16; ventrals 12.

Head large, squarish, its cavities greatly developed, roofed over by very thin membrane; the bones very thin, translucent and flexible. Sides of head vertical; snout very short, bluntly rounded, with slightly projecting median point, below which the profile is vertical; snout about 2 in vertical diameter of orbit. Interorbital space flat, $1\frac{1}{2}$ in vertical diameter of orbit, $3\frac{1}{3}$ to $3\frac{2}{3}$ in head. Orbits and nostrils with prominent bony rims; most of head covered by a translucent integument, the shrinkage of which makes the bones unduly prominent. Mouth terminal, not overpassed by snout, somewhat oblique, the lower jaw included; maxillary reaching beyond hinder edge of orbit, 2 in head. Teeth small, in very narrow villiform bands on both jaws. Those on sides of lower jaw sometimes in a single series. Orbit very large, its horizontal diameter $2\frac{2}{3}$ in head, its vertical diameter $2\frac{1}{2}$ in head, its upper edge entering the profile. Angle of preopercle rounded, its posterior edge vertical. Barbel wanting or excessively minute. Gill membranes united in front, not attached to isthmus. First gill slit nearly equal to diameter of orbit. Body moderately compressed, its width about two-thirds of the depth. Tail very slender. Trunk and tail tapering almost uniformly from head to tip of caudal. Scales very deciduous, large, very thin and flexible, cycloid, smooth: about 5 rows between lateral line and origin of first dorsal. The scales that were still in place were very few, but the above description applies to scales studied in position on the shoulder, on the back in front of first dorsal, on upper part of side below first dorsal, on lateral line, and on belly behind the base of the ventrals. Second dorsal spine smooth. Base of first dorsal equal to interorbital space; distance between dorsals about equal to twice the base of first dorsal. Pectorals very narrow and slender, $1\frac{1}{3}$ in head. Base of ventrals under pectorals, rays slender, the outermost elongated into a filament reaching much beyond origin of anal. Distance from tip of snout to origin of anal about $3\frac{3}{4}$ in total. Vent far back, just in front of origin of anal. Distance from vent to isthmus at least as great as length of head.

Color (in alcohol).—Trunk dark brown; tail light, marked with darker brown: a line of dark-brown dots along axis of tail and a dark mark at the base of each ray of anal and second dorsal fins. Jaws, breast, and belly to origin of anal, intense black: sides of head and trunk silvery, washed with blackish. Gular membrane translucent, with a network of brown lines; lateral portions of isthmus, and a streak extending from them posteriorly above base of ventrals, silvery, crossed by extremely fine parallel brown lines, hardly to be distinguished without the aid of a lens. Base of first dorsal dusky, fins otherwise pale. Inside of mouth dusky or blackish. Peritoneum

silvery or blackish silvery. The typical deep-sea characters are very marked.

Ninety-one specimens, $3\frac{1}{4}$ to 7 inches long, from stations 3467, 3470, 3471, and 3476; 310, 343, 337, and 298 fathoms respectively.

Type.—No. 47735, U.S.N.M.

TRACHONURUS SENTIPELLIS, new species.

(Plate XLV, fig. 1.)

Head about $6\frac{1}{5}$; depth about 8. First dorsal I, 8; pectorals 16 to 17; ventrals 7; second dorsal low; anal rays well developed.

Head compressed, squarish, the sides vertical. Snout short, obtusely conical, overhanging the mouth but little, without tubercles, a little shorter than orbit. Interorbital space flat, a little greater than diameter of orbit. Orbit moderate, nearly circular, $3\frac{2}{3}$ in head. Mouth lateral, entirely below lower rim of orbit, maxillary reaching a little beyond middle of orbit. Teeth in villiform bands in both jaws; the outer series of the upper jaw slightly enlarged. Barbel small, about $2\frac{2}{3}$ in orbit. Gill membranes united with a broad free fold behind. Anterior gill slit short, about $2\frac{1}{4}$ in orbit. Scales firmly embedded, but distinct, imbricated, rather small; 8 scales in a transverse row between the lateral line and origin of first dorsal. Scales from the side above the lateral line with 10 to 11 long, strong spinelets frequently arranged in 3 radiating series; others from back behind origin of second dorsal and from side near origin of anal with about 8 spinelets similarly arranged; one from far back on tail with 9 spinelets in 5 series; others from the back in front of the first dorsal with 8 to 10 spinelets irregularly arranged. Spines on head and anterior part of body short and suberect; posteriorly becoming long, very slender, and closely appressed. Series of scales along the base of anal enlarged, each scale bearing a single oblique row of spines larger than those elsewhere on body. Posteriorly on tail and at extreme anterior end of anal these enlarged scales merge into the ordinary scales of the respective regions. Scales along base of dorsal not enlarged, some of them showing, however, a single oblique series of slightly enlarged spinelets. The whole head, except lips and gular and branchiostegal membranes, completely scaled. Second dorsal spine smooth, slender, $1\frac{2}{3}$ in head. Base of first dorsal a little more than half as long as orbit. Distance between dorsals about twice the base of the first dorsal. Pectorals narrow, about $2\frac{1}{5}$ in head. Ventral rays reaching about to origin of anal, the outer ray but little prolonged. Space between base of ventrals and origin of anal naked. Vent nearer the latter. Distance between base of ventrals and origin of anal two-sevenths of length of head. Origin of anal under middle of interspace between dorsals.

Color (in alcohol).—Dark brownish, darker anteriorly. Lips, mouth, and gill cavities, lining of esophagus and the belly, bluish black. Fins dusky, ventrals blackish. Peritoneum black.

This species is closely related to *Trachonurus villosus*, Günther, but differs from that in being less slender, in its larger eye, larger mouth, longer barbel, number of dorsal spines and pectoral rays, and in the number, character, and arrangement of the spinelets of the scales.

Two specimens, $11\frac{1}{2}$ inches long, from station 3474; 375 fathoms.

Type.—No. 47980, U. S. N. M.

CHALINURA CTENOMELAS, new species.

(Plate XLV, fig. 2.)

Head $5\frac{1}{4}$; depth $6\frac{2}{3}$; B. 7. First dorsal I. 10 to I. 12; pectorals 21; ventrals 9 to 10.

Head cavernous, compressed, cheeks nearly vertical; snout broadly triangular, tapering to a blunt point, short, projecting very little beyond mouth, $1\frac{1}{3}$ in orbit, its tip nearly at the level of the upper margin of the orbits. Interorbital space slightly convex, without prominent ridges, $1\frac{1}{2}$ in diameter of orbit, a slight infraorbital ridge extending from tip of snout to below posterior part of orbit. Mouth lateral, oblique, slightly overpassed by the snout, maxillary reaching nearly to vertical from hinder edge of pupil, $2\frac{1}{3}$ in head. Premaxillary nearly as long as maxillary, heterodont, with an outer row of enlarged, widely set curved teeth, and an inner villiform band. Mandibular teeth in a very narrow band, smaller and more closely set than the outer premaxillary series. Orbit elliptical, large, $2\frac{3}{4}$ to 3 in head. Posterior edge of preopercle nearly vertical, a little incurved. Length of barbel 1 to $1\frac{1}{3}$ in diameter of orbit. Gill membranes narrowly united, joined to the isthmus with a narrow free fold behind. Length of anterior gill slit equal to interorbital width. Body much compressed, its greatest width less than one-half the depth. Base of first dorsal elevated, oblique, its front projecting. Scales somewhat deciduous, of moderate size, with 15 to 20 sharp, slender spinelets, not in definite series, those on the scales of upper side of head and back and abdominal region mostly black. Whole snout, interorbital space, cheeks, opercles, and under side of lower jaw scaly; 10 rows between lateral line and origin of first dorsal. Second dorsal spine somewhat elongated, with 25 or 30 small serrations. Base of first dorsal equal to interorbital space; distance between the first and second dorsals twice or a little more than twice the base of the former. Distance from tip of snout to origin of anal about 4 in total length. Pectorals in axis of body a little more than half length of head. Ventral rays reaching a little beyond origin of anal, the outer rays produced into a short filament. Vent but little behind base of ventrals, distant from them about one-third its distance from front of anal. Distance between vent and isthmus more than half length of head.

Color (in alcohol).—Upper one-third of trunk and tail brownish; cheeks and lower two-thirds of sides silvery; sides and tail speckled

with brownish dots. Lips, under side of head, branchiostegal membranes, gill cavities, back part of mouth, distal part of first dorsal, base of pectoral, and most or whole of ventral fins brownish black. Ventral part of body from the isthmus to or beyond origin of anal bluish black; a faint dark elongate spot under the posterior part of orbit. Peritoneum bright silvery, dotted with black.

Young more slender, less deep, eye larger.

Seven specimens, $4\frac{1}{4}$ to 8 inches long, from stations 3470 and 3472; 343 and 295 fathoms, respectively.

Type.—No. 47704, U.S.N.M.

OPTONURUS ATHERODON, new species.

(Plate XLVI, fig. 1.)

Head 5; depth $5\frac{5}{6}$; B. 7. First dorsal I, 10 to I, 11; anal about 130; pectorals 20 to 23; ventrals 10.

Series of large, cavernous pits and depressions on top of head; suprascapular region and preorbital covered with thin translucent integument. Head very cavernous, compressed. Snout broad, short, $1\frac{1}{2}$ in orbit, its preoral portion 3 in orbit. Interorbital space flat, $1\frac{1}{4}$ to $1\frac{1}{2}$ in orbit. A median ridge extending from behind tip of snout over the interorbital space to about opposite the middle of the orbits, where it joins a transverse ridge. The interorbital space between this ridge and edges of the orbits covered by a thin, translucent membrane beneath which are large cavities. A pair of small, curved ridges (with their convex sides directed medianward) on the occiput. Quite prominent bony rims around the nostrils. Mouth terminal, lateral, oblique, jaws about equal, the lower, little included, maxillary reaching middle of orbit, nearly half as long as head, its posterior end much narrowed and directed ventrally. Premaxillary nearly as long as maxillary, heterodont, with an outer series of widely set canines with distinctly arrow-shaped tips, and an inner villiform band. Mandibular teeth small, closely set in a very narrow band, the inner series slightly enlarged. Orbit very large, $3\frac{1}{4}$ in head, its upper edge nearly entering the profile. Preorbital narrow, $2\frac{1}{5}$ in orbit. Posterior edge of preopercle nearly vertical, slightly incurved. Barbel a little more than one-half length of orbit. Gill membranes rather broadly united in a free fold across the isthmus. The length of the anterior gill slit $1\frac{1}{3}$ to $1\frac{1}{4}$ times the interorbital width. Body compressed, its greatest width one-half its height. Scales very deciduous, of moderate size, thickly covered with short blackish spinelets not arranged in series. Head apparently entirely scaled; 10 to 12 series between origin of dorsal and lateral line. Second dorsal spine smooth, $1\frac{3}{4}$ in head. Base of first dorsal equal to interorbital space. Origin of first dorsal over axil of pectorals. Second dorsal low; distance of its origin from end of first dorsal nearly three times the base of the latter. Origin of anal under or slightly in

front of end of first dorsal; its distance from base of ventrals one-third to one-fourth of length of head. Pectorals in axis of body narrow, slightly more than half length of head. Outer ray of ventrals produced into a filament which reaches beyond origin of anal. Vent well forward, immediately behind base of ventrals; no naked pit between bases of ventrals. Distance between vent and isthmus more than half length of head.

Color (in alcohol).—Cheeks, opercles, and lower two-thirds of sides silvery; the sides, especially on tail, speckled with minute dark dots. Upper one-third of sides brownish, the line between the brown and the silvery of the sides sharply defined. Snout, lips, lower side of head, branchiostegal membranes, gill cavities, and posterior part of mouth cavity brownish black. A brown band from eye backward and downward across cheeks. A fainter band from eye along upper edge of cheeks and opercles; a third band seen through the transparent membrane covering the infraorbital ring; narrow posterior margin of premaxillary velum black; a small black blotch either side of vomer. Ventral side of body from isthmus to or a little beyond origin of anal bluish black. Pectoral and ventral fins dusky. Peritoneum bright, silvery, somewhat dotted with black specks.

Thirty specimens, $5\frac{1}{2}$ to $13\frac{1}{2}$ inches long, from stations 3470, 3471, 3474, 3475, and 3476; 343, 337, 375, 351, and 298 fathoms, respectively.

Type.—No. 47729, U.S.N.M.

MALACOCEPHALUS LÆVIS, Lowe.

Hitherto recorded only from the Atlantic, and from Andaman Sea (Alcock).

Ten specimens, the smallest $12\frac{3}{4}$ inches, from stations 3470, 3472, 3475, and 3476; 343, 295, 351, and 298 fathoms respectively.

Family PLEURONECTIDÆ.

PELECANICHTHYS, new genus.

Eyes and color on the left side. Mouth symmetrical, of enormous extent, gape about as long as head. Mandibles extending anteriorly far beyond tip of snout, the projecting portion decurved and falciform; the rami very slender and flexible, each rotating inward, so that the teeth of the two rami meet and interlock in the closed mouth, instead of being opposed to those of the upper jaw. Mandibular membranes voluminous, forming a veritable gular pouch and permitting wide divarication of the mandibular rami, which can be also closely apposed for their entire length. The angular forms a slender process, projecting beyond the mandibular articulation and extending behind the posterior margin of the opercle. Premaxillary, maxillary, and palatopterygoid formed of three very slender bony rods, parallel and closely juxtaposed for the greater part of their length. Branchiostegals 7.

Gill rakers absent. Preopercular margin free. Dorsal and anal fins very long, the former commencing on the snout. Caudal peduncle extremely short, a low fin-fold joining dorsal and anal with rudimentary caudal rays. Caudal lanceolate. Ventrals unsymmetrical, the left slightly more anteriorly placed, inserted on the ridge of the abdomen, its membrane leading to base of first anal ray. Vent displaced well to the right side of the ridge slightly in advance of front of anal, a small papilla (genital papilla?) occupying a corresponding position to the left of the ridge. Scales excessively fine. Lateral line single, conspicuous, continued on to the caudal fin; with a short, low anterior arch.

PELECANICHTHYS CRUMENALIS, new species.

(Plate XLVII.)

Head (horizontal length) $4\frac{1}{3}$ to $4\frac{1}{2}$ ($5\frac{1}{4}$ in smallest specimen); depth $3\frac{1}{2}$ to $3\frac{3}{4}$ (4 in smallest); dorsal 121; anal 88; pectorals 13 or 14; ventrals of both sides with 6 rays; about 230 to 240 pores in the course of the lateral line.

Body slender, excessively compressed, tapering slowly and uniformly toward tail, the two outlines very weakly arched for the greater part of their extent. Anterior outline of head strongly decurved, the physiognomy resembling that of *Glyptocephalus*. Bases of dorsal and anal fins wide, translucent, sharply marked off from rest of body, constituting together half the greatest depth of body. Abdomen very short.

Head very obliquely placed, the eyes closely approximated near the upper anterior profile, the cheeks narrow, oblique, the upper limb of preopercle nearly horizontal, the lower limb nearly vertical. Mandible extending beyond premaxillaries for over one-fourth its length. The rami are so articulated as to permit a slight inward and outward rotation on their long axes, in addition to other movements. The gular membrane is large and loose, falling into folds when the jaws are closed. The entire mechanism of the lower jaw seems adapted to seizing food between the rami, and forcing it down between and below them. Teeth in both jaws in a somewhat uneven single series, those in mandible largest, smaller teeth irregularly alternating with the larger ones in both jaws. Posterior third of both jaws toothless. Palate smooth. Anterior nostril with an overarching flap or short tube. Posterior nostril without tube.

Eyes elliptical, nearly even, long axis of lower eye very oblique. Oblique diameter of upper orbit $3\frac{3}{4}$ in head; the snout short, five-sevenths diameter of upper eye. Interorbital space narrow, grooved, $\frac{1}{2}$ width one-fifth diameter of upper eye.

Dorsal fin beginning above anterior nostril, the first few rays slightly displaced toward the blind side. Pectorals narrow, pointed, about $1\frac{3}{4}$ in length of head, that of blind side apparently shorter. Caudal lanceolate in a young specimen (mutilated in adult), the middle rays $1\frac{1}{4}$ in head.

Jaws, snout and interorbital space naked; head and body elsewhere covered with minute cycloid scales. Lateral line nearly axial, its anterior arch low, above the head, the posterior downward curve abrupt, above base of pectoral; length of arch nearly equal to half depth of body.

Color (in alcohol).—Head and body light brown, the outlines of the scales dusky, the wide bases of dorsal and anal fins semitranslucent. Abdomen in the adult with narrow vertical stripes of blue-black, alternating with the wider muscular bands which are of the ground color. Head and anterior median portion of trunk with faint darker brown spots about one-third size of pupil. In addition to these, the median part of body is marked with about 45 larger round spots, darker than the others, but still faint and ill defined. These are nearly as large as eye, and are arranged on anterior part of trunk in 7 lengthwise series, all but 3 of which gradually disappear on tail. The larger spots are much more distinct in young specimens than in adults. Mouth and gill cavity white. Peritoneum black. Fins dusky.

Three specimens, 7 to 10 inches long, from stations 3472 and 3476; 295 and 298 fathoms, respectively.

Type.—No. 48738, U.S.N.M.

Family MALTHIDÆ.

MALTHOPSIS MITRIGER, new species.

(Plate XLVIII, figs. 1, 2.)

Branchiostegals 4; dorsal I, 4 to 5; anal 4; pectorals 14; ventrals I, 5; pores of lateral line behind disk 9.

The disk strongly depressed, triangular, its greatest width (exclusive of the posterior lateral projections) $1\frac{2}{3}$ in length of body exclusive of caudal, its depth about 4. Body behind disk tapering nearly uniformly. Body nearly everywhere covered with radially striated tubercular plates. Gular region and branchiostegal membranes naked. The vent lies in the center of a naked, somewhat elliptical basin surrounded by a ridge of tubercles. A shallow pit behind base of ventrals. Head vertical in front. The tentacular pit triangular, higher than wide, its upper angle on a level with the upper edge of pupil. The pit is surmounted by a large, conical median tubercle projecting upward and slightly forward, the length of which is about 2 in orbit. At each side of this tubercle is another smaller one projecting upward and outward. The club-shaped tentacle, when extended, not quite reaching front of upper jaw. Eyes large, the orbits strongly convergent, distance between their anterior edges $2\frac{1}{2}$ in the distance between their posterior edges. Mouth somewhat oblique; bands of very minute teeth on jaws, vomer, and palatines. Width of mouth and diameter of orbit about equal. Gills 2 on each side, only a narrow membrane on first

arch; gill rakers minute. Subopercular spine flat, long, extending laterally and armed at tip with 2 to 5 small spinelets. Pectorals about $4\frac{1}{2}$ in length of body, the rays very close-set; ventrals about 7 and caudal 6 in length of body. Vertical fins weak.

Color (in alcohol).—Body and all the fins pale, yellowish. Peritoneum dusky.

Length, 3 inches.

Stations 3467, 3472, and 3476; 310, 295, and 298 fathoms, respectively.

Type.—No. 47700, U.S.N.M.